

## KING PIN LOCK DEVICE

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### BACKGROUND OF THE INVENTION

#### Field of Invention

The present invention relates to a king pin lock device. More particularly, the  
10 present invention relates to a device for preventing theft of trailers equipped with  
a king pin hitch.

#### Background

Trailers and equipments employing the king pin trailer hitch are susceptible to  
15 theft. They are easily stolen by being attached to and towed by a vehicle having  
an appropriate connection to the hitch.

Other devices have been employed in an attempt to prevent the theft of objects  
equipped with a king pin hitch. However, users do not have faith in current  
20 products. For example, for certain "tea cup" style king pin locks, a truck can  
simply back into the device with enough force and still connect to the trailer and  
steal it.

Additionally, many of the existing king pin locks have exposed parts that are easy  
25 to defeat with common burglary tools such as pry bars, bolt cutters,  
sledgehammers, torches, and hacksaws. Furthermore, existing king pin locks  
engage the king pin only on one side.

Some of the existing devices are too costly to manufacture. They have many  
30 parts, which add to their expense.

There is a need to provide a king pin trailer hitch lock that is simpler to make,

simpler to use, and harder to defeat. It is desirable to provide a king pin trailer hitch lock which does not leave the lock or locking mechanism exposed for easy access. Additionally, it is desirable to provide a king pin trailer hitch lock that is larger than others on the market, making it more difficult to force a connection  
5 between a trailer and truck. Finally, it is desirable to provide a king pin trailer hitch lock that is very durable yet inexpensive to produce.

## SUMMARY OF INVENTION

10 In one embodiment of the present invention, the lock device is made of a lock body having a first end and second end. The lock device can be made of stainless steel, aluminum, iron, titanium, or any alloy thereof or other suitable materials. The lock body is large enough to prevent a forced connection between truck and trailer, completely covering the king pin hitch, yet not so large  
15 as to make it difficult to install the device onto the hitch.

In another embodiment the first end has an internal circular aperture in which fits a given king pin hitch. Inside the internal circular aperture of the first end is an inner flange to engage the king pin. The other side of the king pin is engaged by  
20 a lock bar that slides into place to secure the king pin in the lock body. Thus, instead of only engaging the king pin hitch on just one side, it is engaged on more than one side, making a stronger connection between the lock device and the hitch.

25 In yet another embodiment the second end has a circular aperture in which fits a lock. There is a retaining bar in the circular aperture that is immobile and contains a hole through its center in which the lock engages. The lock when engaged secures the lock bar that is moveable with respect to the lock body, locking the king pin hitch.

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In still another embodiment of the present invention, the circular aperture of the

second end engulfs a round puck lock with a step to secure, such that upon locking the round puck lock, the king pin hitch is secured between the moveable bar and the inner flange in the first end. The round puck lock is a common item, also known as a step-in-lock, used mainly in the vending business.

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In another embodiment of the present invention, the round puck lock is surrounded by a perimeter wall to hide the lock connection. The lock mechanism is not visible and not exposed to tools to defeat it.

10 In yet another embodiment of the present invention, the lock device is made of a material with a predetermined strength, such that cutting through the device is made very difficult.

15 In still another embodiment of the present invention, there is a bright tag attached to the lock device to warn against accidental backing into the king pin hitch in its locked state.

Therefore, the present invention satisfies the long-felt need to provide a king pin trailer hitch lock device that is durable, easy to manufacture, easy to use, and  
20 hard to defeat. The lock is large enough to prevent theft by forcing a connection between a truck and trailer, and the king pin hitch is engaged on more than one side for a stronger connection. Finally, it has few parts, which makes it less expensive to manufacture.

25 These and other embodiments of the present invention are further made apparent, in the remainder of the document, to those of ordinary skill in the art.

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## BRIEF DESCRIPTION OF THE DRAWINGS

In order to more fully describe embodiments of the present invention, reference is made to the accompanying drawings. These drawings are not to be  
5 considered limitations in the scope of the invention, but are merely illustrative.

FIG. 1 illustrates a perspective view of an embodiment of the lock body of the present invention that is engaged with a king pin trailer hitch.

10 FIG. 2 illustrates a cross sectional perspective view of FIG. 1 engaged with a king pin trailer hitch.

FIG. 3 illustrates a perspective view of an embodiment of the device not engaged with a king pin trailer hitch.

15 FIG. 4 illustrates a bottom perspective view of an embodiment of the lock device in the engaged position, with the lock body and puck lock in a locked position.

FIG. 5A illustrates the bottom perspective view of a round puck lock that is used  
20 in conjunction with the present invention, in its locked state.

FIG. 5B illustrates the bottom perspective view of a round puck lock that is used in conjunction with the present invention, in its unlocked state.

## 25 DETAILED DESCRIPTION OF SPECIFIC EMBODIMENTS

The description above and below and the drawings of the present document focus on one or more currently preferred embodiments of the present invention and also describe some exemplary optional features and/or alternative  
30 embodiments. The description and drawings are for the purpose of illustration and not limitation. Those of ordinary skill in the art would recognize variations,

modifications, and alternatives. Such variations, modifications, and alternatives are also within the scope of the present invention. Section titles are terse and are for convenience only.

5 The present invention addresses all of the concerns mentioned above. A preferred embodiment of the present king pin lock device is made of stainless steel with substantial thickness such that it would take an enormous amount of time to cut through and defeat with a hacksaw or chainsaw. The present invention can also be made of other metals such as aluminum, iron, titanium, or  
10 any of the alloys thereof.

There are no exposed areas that could be susceptible to bolt cutters to disengage the locking mechanism. Prying devices have no significant area of opportunity in which to apply pressure to the present invention.

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The embodiment of the instant lock device protects the locking mechanism itself. The round puck lock itself is encompassed by the device and the locking shaft is hidden from view. The lock is not exposed to threats of prying or cutting.

20 In Fig. 1, a lock body **100** is shown in its engaged form fitted over a king pin trailer hitch **50** drawn in broken lines. The lock body **100** engages the king pin trailer hitch **50** in a manner such that the king pin **50** is completely covered by the lock body **100**, and, once locked in place by a lock or locking device (such as the round puck lock **20** shown in Fig. 4, 5A and 5B), any attempt to engage the king  
25 pin trailer hitch **50** is prevented.

In this embodiment, the lock body **100** has a first end **101** and a second end **102**. The first end contains an internal chamber **120** capable of receiving a king pin **50**. The second end **102** has a second end perimeter wall **130**, and an internal  
30 aperture **141** capable of receiving a lock or locking device (such as the round puck lock **20** shown in Fig. 4, 5A and 5B). The second end perimeter wall **130** is of sufficient diameter to accommodate and surround a conventional round puck

lock **20** shown in Fig. 5A and 5B. Within the internal aperture **141** is an inner surface **135** that is shaped in a corresponding manner to the bottom **25** of the round puck lock **20** shown in Fig. 5A and 5B such that the round puck lock **20** fits into the second end **102** when the lock body **100** is in its engaged state (Fig. 1, 2, and 4).

Within the internal aperture **141** is a retaining bar **140** that is immobile with respect to the lock body **100**. The retaining bar **140** has a hole **142** in which the lock or locking mechanism can engage. The second end perimeter wall **130** has a key insert window **131** to provide access to the lock or locking device that fits into the internal aperture **141** of the second side **102** of the lock body **100**. In this embodiment, the internal aperture **141** and retaining bar **140** are designed to fit a conventional round puck lock, such as the round puck lock **20** shown in Fig. 4, 5A and 5B, or another suitable lock or locking device. The second end perimeter wall **130** and inner surface **135** are shaped in a corresponding manner to the round puck lock **20** and bottom **25** of the round puck lock such that a secure juncture between the round puck lock and the second end **102** at its inner surface **135** is made possible. The round puck lock **20** and shape of the second end **102** hinder any attempts to tamper with the locking mechanism. The round puck lock **20** fits into the internal aperture **141** of the second end **102** of the lock body **100**, and the retaining bar **140** fits into the lock insert **24** of the round puck lock, with the bolt **21** of the puck lock **20** fitting through the hole **142** of the retaining bar **140** when the puck lock **20** is engaged in the lock body **100** (see Fig. 5A and 5B).

The edges of the lock body **100** are formed such that the lock body **100** when engaging a king pin hitch **50** cannot be attached to a pulling device by a potential thief. There are also optional grooves **150** on the lock body **100** for ease of handling during use.

Fig. 2 shows a cross-sectional perspective view of a lock body **100** of an

embodiment of the present invention engaged with a king pin **50** (shown in broken lines). The lock body **100** comprises a first end **101** and a second end **102**. The internal chamber **120** of the first end **101** is of a sufficient size larger than a diameter of a given king pin hitch **50**, allowing the hitch to enter the chamber **120** and be engaged by the lock body **100**. The first end **101** of the lock body **100** has an inner flange **112** protruding into the internal chamber **120** to engage the king pin **50**. The king pin **50** is also engaged and held firmly against the inner flange **112** in the lock body **100** by the lock bar **145** upon engagement. In this embodiment the lock bar **145** has an edge **146** proximal to the internal chamber **120** such that the longer portion of the edge of the lock bar fits into the annular groove **51** of the king pin **50**, while the shorter portion of the edge of the lock bar fits onto a lower annular surface **52** of the king pin **50**.

The lock bar **145** is moveable with respect to the lock body **100** to engage and disengage the king pin hitch **50**. A setscrew **165** or similar rod-like structure, such as a screw, nail, bolt, etc., can be secured to the lock bar **145** at a threaded setscrew hole **147** to move the lock bar **145** to its engaged and disengaged positions (see Fig. 4). The setscrew **165** protrudes through a slot **160** in the lock body **100** for user access.

The second end **102** has an internal aperture **141** surrounded by a second end perimeter wall **130**. The internal aperture **141** contains a retaining bar **140** that is immobile with respect to the lock body **100**. The retaining bar **140** has a hole **142** (Fig. 1) to receive the locking mechanism of a suitable lock such as the conventional round puck lock **20** shown in Fig. 4, 5A and 5B.

Fig. 3 shows a perspective view of an embodiment of the present invention in its disengaged state. The lock body **100** has a first end **101** and a second end **102**. In its disengaged state the moveable lock bar protrudes into the internal circular aperture **141** of the second end **102** of the lock body **100**.

Fig. 4 illustrates a bottom perspective view of an embodiment of the present invention shown in its engaged position, having a puck lock **20** in a locked position secured to the second end **102** of the lock body **100**. The second end perimeter wall **130** encompasses the round puck lock **20** when the puck lock **20** is inserted in the internal circular aperture **141** of the second end **102**, such that the second end perimeter wall **130** protects the puck lock, and the extending lock mechanism **22** of the puck lock **20** is hidden from view when the puck lock is in a locked state **20** in the lock device **10** (see Fig. 5A and 5B). The puck lock **20** is not exposed to any threats of prying or cutting. The second end perimeter wall **130** has a key insert window **131** to provide the user access to the key hole **26** of the extended lock mechanism **22** of the conventional round puck lock **20**.

The lock body **100** also has a slot **160** through which a setscrew or similar rod-like structure **165** protrudes. The setscrew **165** is secured to the lock bar **145** (see Fig. 2) at a threaded setscrew hole **147** in the lock bar **145** and allows the user to move the lock bar **145** to engage and disengage the king pin **50**. The setscrew **165** has a head **166** that has a larger diameter than the width of the slot **160** in the lock body **100**. The threaded setscrew hole **147** (Fig. 2) is deep enough so that the setscrew **165** can be screwed down by the user on to the lock body **100** to secure the lock bar **145** in a given position along its path of movement defined by the slot **160**. Optionally, attached to the set screw **165** is a bright-colored tag, or other bright colored attachment, to warn against accidental backing up of a truck into the locked kingpin (not shown).

Fig. 5A shows a bottom view of a conventional round puck lock **20** in a locked state, while Fig. 5B shows a bottom view of a round puck lock **20** in an unlocked state. The round puck lock **20** engages with the retaining bar **140** of the lock body **100** of the present invention at a lock insert **24** (see Fig. 1). The inner surface **135** of the internal aperture **141** of the second end **102** of the lock body **100** is shaped such that it accommodates the bottom **25** of round puck lock **20** to form a secure juncture (see Fig. 1). The retaining bar **140** of the second end **102**



of the lock body **100** is received by the lock insert **24** of the round puck lock **20** in this embodiment. The round puck lock **20** secures the lock body **100** in an engaged position (Fig. 1, 2, and 4) when a key **23** is used to engage an extending lock mechanism **22**, such that a bolt **21** protrudes through the lock insert **24** and secures the puck lock **20** to the lock device **100** by the bolt **21** passing through the hole **142** in the retaining bar **140** of the second end **102** of the lock body **100**.

A preferred embodiment of the lock body **100** is made of stainless steel with substantial thickness that it is structurally extremely strong, and would take an enormous amount of time to cut through with a hacksaw or chainsaw. The lock body **100** can also be made of other metals such as aluminum, iron, titanium, or any alloy thereof.

In the lock device's engaged form, there are no exposed areas which render the round puck lock **20** susceptible to bolt cutters. Prying devices have no significant area of opportunity in which to apply pressure to the present invention in order to disengage or remove the round puck lock **20**.

Throughout the description and drawings, example embodiments are given with reference to specific configurations. It will be appreciated by those of ordinary skill in the art that the present invention can be embodied in other specific forms. Those of ordinary skill in the art would be able to practice such other embodiments without undue experimentation. The scope of the present invention, for the purpose of the present patent document, is not limited merely to the specific example embodiments of the foregoing description, but rather is indicated by the appended claims. All changes that come within the meaning and range of equivalents within the claims are intended to be embraced within the spirit and scope of the claims.